ANNEX

RECOMMENDATION ON THERMAL RADIATION TEST SUPPLEMENT TO FIRE RESISTANCE TESTS FOR "A", "B" AND "F" CLASS DIVISIONS

1 Scope

This recommendation specifies a procedure for measuring heat radiation through windows as a basis for characterizing their ability to maintain the integrity of thermal and structural boundaries and thus their suitability for use in marine construction. The emissive power limits specified in the table should not apply to A-0 windows adjacent to category (5) areas.

2 Test procedure

2.1 The window should be tested in accordance with the Recommendation on Fire Resistance Tests for "A", "B" and "F" Class Divisions (resolution A.754(18)), using the additional instrumentation as described below.

2.2 The term "window" includes windows, side scuttles and any other glazed opening provided for light transmission or vision purposes in a fire resistant division. The term "fire resistant division" includes bulkheads and doors.

3 Additional instrumentation

3.1 Additional instrumentation consists of a restricted-view total-heat fluxmeter of the Schmidt-Boelter thermopile type*, calibrated with the restricted view to indicate incident heat flux**. The fluxmeter should be water-cooled, and have a range of 0 to 50 kW/m^2 when testing windows to A-0 and B-0 standards.

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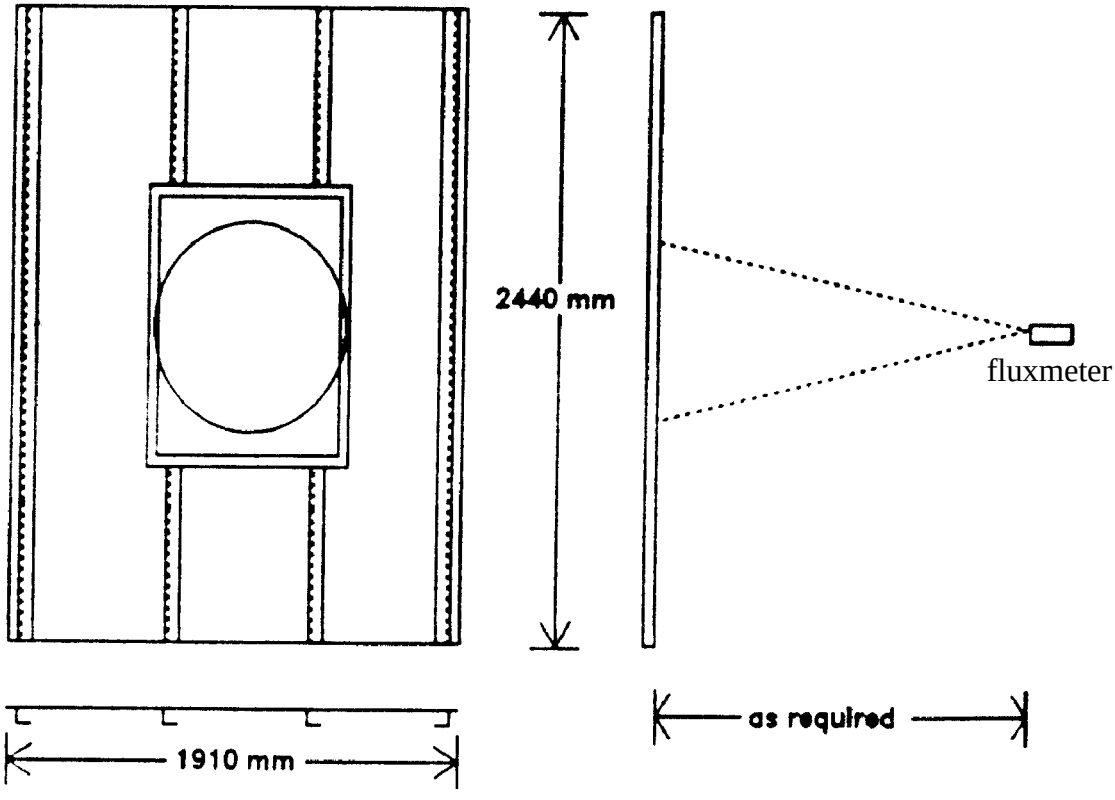
* Schmidt-Boelter thermopile type heat flux transducers without windows and having a restricted view of 30º and 60º, such as the 64 series manufactured by Medtherm Corporation, have been found to be acceptable.

** As defined by Medtherm Corporation in their fluxmeter calibration. If the fluxmeter only views the radiative source, incident heat flux is the emissive power of the radiative source minus any attenuation by the intervening air. The emissive power is the rate of radiative energy per unit area from a surface.

Table 1. Criteria For Heat Flux

Fire Resistant Division Classification	Time Period From Beginning of Test To	Emissive Power E_c (kW/m^2)
A-0	60 minutes	56.5
A-15	15 minutes 60 minutes	2.34 8.0
A-30	30 minutes 60 minutes	2.34 6.4
A-60	60 minutes	2.34
B-0	30 minutes	36.9
B-15	15 minutes 30 minutes	2.34 4.3



Figure

3.2 The fluxmeter should be placed perpendicular to the centre of the window being tested, and in a position such that the centre of the fluxmeter's view coincides with the centre of the window* (see the figure). The fluxmeter should be located at a distance greater than 0.5 m from the window, such that the view of the fluxmeter just includes part of the window frame while remaining outside of the convective boundary layer of the test specimen. However, the fluxmeter should not be located more than 2.5 m from the window.

3.3 For windows whose greater dimension is less than 1.57 times the smaller dimension, only one fluxmeter is needed.

3.4 For oblong windows whose greater dimension is more than 1.57 times the smaller dimension, additional fluxmeters should be provided. The distance of the fluxmeters from the window should be adjusted such that the fluxmeters' view covers at least 50% of the window. However, the fluxmeters should not be located less than 0.5 m nor more than 2.5 m from the window.

4 Test specimens

The maximum size (in terms of width and height) of each type of window for which approval is sought should be tested.

5 Classification criteria

5.1 The peak radiant flux (E_w) should be measured for the first 15 min of the test, for the first 30 min of the test, and for the entire duration of the test (i.e., 60 min for class "A" and 30 min for class "B" boundaries).

5.2 The peak radiant fluxes (E_w) measured in accordance with paragraph 5.1 should be compared against the reference value (E_c) from the table.

5.3 If (E_w) is less than (E_c), the window is acceptable for installation in a boundary of the corresponding fire resistant classification.

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* A satisfactory method of placing, mounting, and aiming the fluxmeter is as follows: A metal stand constructed of a pipe mounted on a sturdy base serves as an instrument tree to locate the fluxmeter at the required distance from the test specimen. A suitable holder for the fluxmeter is constructed by mounting a gun-sight mount on a lockable ball and socket joint. This joint provides flexibility for aiming the meter. The fluxmeter holder is mounted on the instrument tree at the appropriate height. A laser pointer is placed in the gun-sight mount and the mount is oriented such that the dot is in the centre of the window. The laser pointer is slipped out of the holder and replaced by the fluxmeter.
